DRAFT
ENGINEERING EVALUATION
Chiron Corporation
PLANT NO. 8025
APPLICATION NO. 14280

BACKGROUND

The Chiron Corporation is applying for modification to the Permit to Operate the following equipment:

S-27 Johnston Boiler - Multifuel, 450 HP, 18.96 MMBtu/hr

Permit condition 11033, part 5 limits the annual usage of natural gas at S-27 to 400,000 therms in any consecutive twelve-month period. The Chiron Corporation is requesting an increase in the annual usage rate of natural gas at S-27 from 400,000 therms/year to 530,000 therms/yr.

EMISSIONS SUMMARY

Annual Emissions:

The applicant will fire an additional 130,000 therms/yr (12,380.95 thou cf) of natural gas at S-27. Permit condition 11033, parts 2 and 4 currently limit the emission factors for NOx and CO. NOx emissions are limited to 25 ppmvd at 3% O2 and CO emissions are limited to 50 ppmvd at 3% O2. The POC, SO2, and PM10 emission factors are currently used for the S-27 Boiler by the District. The boiler is used 8760 hrs/yr.

Exhaust flow: (8710 dscf/MMBtu)*(21((21-3)) = 10,161.67 dscf/MMbtu at 3% O2

n = PV/RT = (1 atm*10,161.67 dscf/MMbtu)/((0.7302 atm-cf/lb-mol R)*(68 + 460 R))
= 26.3566 lb-mol/MMBtu

NOx emission factor: = 26.3566 lb-mol/MMBtu(25 lb-mol NOx/1E6 lb-mol)(46 lb NOx/lb-mol NOx)
= 0.0303 lb/MMBtu (MMBtu/1E6Btu)(1050 Btu/cf)(1000 cf/thou cf)
= 0.0318 lb/thou cf

CO emission factor: = 26.3566 lb-mol/MMBtu(50 lb-mol NOx/1E6 lb-mol)(28 lb NOx/lb-mol NOx)
= 0.0369 lb/MMBtu (MMBtu/1E6Btu)(1050 Btu/cf)(1000 cf/thou cf)
= 0.0387 lb/thou cf

Increase in Emissions:
NOx = (0.0318 lb/thou cf)(12,380.95 thou cf/yr) = 393.71 lb/yr = 0.197 tpy
POC = (5.7E-3 lb/thou cf)(12,380.95 thou cf/yr) = 70.57 lb/yr = 0.035 tpy
CO = (0.0387 lb/thou cf)(12,380.95 thou cf/yr) = 479.14 lb/yr = 0.240 tpy
SO2 = (5.68E-4 lb/thou cf)(12,380.95 thou cf/yr) = 7.032 lb/yr = 0.004 tpy
PM10 = (3.0E-3 lb/thou cf)(12,380.95 thou cf/yr) = 37.14 lb/yr = 0.019 tpy

In application 12667 (April, 1994), S-27 was permitted to burn distillate oil for short test periods (30 hrs/year maximum) and during periods of natural gas curtailment by PG&E. S-27 was permitted to burn only natural gas at all other times. Emissions from application 12667 are tabulated below, along with emissions from this application (#14820).

Total S-27 Emissions:

Pollutant	Annual emissions from application 12667	Increase in annual emissions from this application (14280)	Total Annual Emissions	Total Daily Emissions
NOx	0.590 tpy	0.197 tpy	0.787 tpy = 1,574 lb/yr	4.31 lb/day
POC	0.060 tpy	0.035 tpy	0.095 tpy = 190 lb/yr	0.52 lb/day
CO	0.730 tpy	0.240 tpy	0.970 tpy = 1,940 lb/yr	5.31 lb/day
SO2	0.020 tpy	0.004 tpy	0.024 tpy = 48 lb/yr	0.13 lb/day
PM10	0.100 tpy	0.019 tpy	0.119 tpy = 238 lb/yr	0.65 lb/day

Plant Cumulative Increase: (tons/year):

Pollutant	**Existing**	**New**	**Total**
NOx	8.390	0.197	8.587
POC	12.516	0.035	12.551
CO	6.355	0.240	6.595
SO2	0.166	0.004	0.170
PM10	0.744	0.019	0.763
NPOC	0	0	0

Toxic Risk Screening:

Emissions of toxic air contaminants from the natural gas fired boiler, S-27, do not exceed any District trigger level of Regulation 2-5 and a Toxics Risk Screen is not required.

530,000 therms/yr (8760 hrs/yr)

	Emission Factor	Emissions		Trigger Levels	
	(lbs/therm)	lbs/hr	lbs/yr	lbs/hr	lbs/yr
Benzene	2.06E-7	1.247E-5	0.1092	2.9	6.4
Formaldehyde	7.35E-6	4.447E-5	3.8955	0.21	30
Toluene	3.33E-7	2.015E-5	0.1765	82	12,000

STATEMENT OF COMPLIANCE

The owner/operator of S-27 Boiler shall comply with Reg. 6 (Particulate Matter and Visible Emissions Standards) and Reg. 9-1-301 (Inorganic Gaseous Pollutants: Sulfur Dioxide for Limitations on Ground Level Concentrations). The owner/operator is expected to comply with Regulation 6 since routine operations at S-27 are conditionally permitted to be fueled with natural gas. Thus for any period aggregating more than three minutes in any hour, there should be no visible emission as dark or darker than No. 1 on the Ringlemann Chart (Regulation 6-301) and no visible emission to exceed 20% opacity (Regulation 6-302). Sulfur oxides are also very low since natural gas is being used to fire the compressor. Sulfur compounds are removed from natural gas at processing plants. S-27 is conditionally permitted not to exceed NOx emissions of 25 ppmvd at 3% O2 when firing natural gas. This meets the emission limit of

30 ppmvd at 3%O2 in Regulation 9-7-301.1. S-27 will be conditionally permitted not to exceed NOx emissions of 40 ppmvd at 3%O2 when firing distillate oil. This is equivalent to the emission limit of 40 ppmvd at 3% O2 in Regulation 9-7-302.1.

The project is considered to be ministerial under the District's CEQA regulation 2-1-311 and therefore is not subject to CEQA review. The engineering review for this project requires only the application of standard permit conditions and standard emissions factors and therefore is not discretionary as defined by CEQA. (Permit Handbook Chapter 2.1 for Boilers)

The project is within 1000 feet of Pacific Rim School (K-6th Grade) and is therefore subject to the public notification requirements of Reg. 2-1-412. A public notice will be prepared and sent to:

All addresses within 1000 feet of the natural gas fired boiler
Parents and guardians of students at the Pacific Rim School

All comments received during the 30-day comment period will be addressed.

Best Available Control Technology: In accordance with Regulation 2, Rule 2, Section 301, BACT is triggered for any new or modified source with the potential to emit 10 pounds or more per highest day of POC, NPOC, NOx, CO, SO_2 or PM_{10}. Based on the emissions calculations above, the owner/operator is not subject to BACT.

Offsets: Offsets must be provided for any new or modified source at a facility that emits more than 10 tons/yr of POC or NOx per Regulation 2-2-302. The District may provide offsets from the Small Facility Banking Account for a facility with emissions between 10 and 35 tons/yr of POC or NOx, provided that facility has no available offsets. Based on the emission calculations above, offsets of POC are required from the Small Facility Banking Account for this application.

S-27 Boiler is subject to NSPS Subpart Dc: Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units. The primary fuel used to fire S-27 boiler is natural gas, but distillate oil is allowed during short test periods (30 hours/year maximum, 4060 gallons/yr maximum) and during periods of natural gas curtailment by PG&E. The distillate fuel fired by Chiron is California diesel that has a sulfur content less than 0.5 weight percent, which meets the requirements in NSPS Subpart Dc. The sulfur content of the diesel fuel must be certified from the fuel supplier. Any reporting and recordkeeping shall be kept as per part 60.48c.

PSD and NESHAPS do not apply.

PERMIT CONDITIONS
In permit condition 11003 for S-27 Boiler, the annual fuel firing limit for natural gas will be increased and NSPS Subpart Dc requirements will be added. The NOx emission limit for firing of distillate oil will also be updated to reflect updated District regulations (Regulation 9-7-302.1). Changes are in strikeout/underline format.

COND# 11003 ----------
Application 12667 (April, 1994): Original application for S-27.
Application 14280 (March, 2006): Increase annual fuel firing limit and add NSPS Subpart Dc requirements.

S-27 Johnston Boiler - Multifuel, 450 HP, 18.96 MMBtu/hr

1. S-27 Boiler shall burn only natural gas except that distillate oil be permitted only during short test periods (30 hours/year per unit maximum) and during periods of natural gas curtailment by Pacific Gas and Electric Company.

2. NOx emissions shall not exceed 25 ppm (reference 3% O2, dry) at any firing rate when firing natural gas.

3. NOx emissions shall not exceed 40 ppm (reference 3% O2, dry) at any firing rate when firing distillate oil.
(basis: Regulation 9-7-302.1)

4. CO emissions shall not exceed 50 ppm (reference 3% O2, dry) at any firing rate.

5. The total usage of natural gas shall not exceed 530,000 therms for S-27 Boiler in any consecutive twelve (12) month period.
(basis: Cumulative increase)

6. For testing purposes, the total usage of fuel oil shall not exceed 4060 gallons for S-27 Boiler in any consecutive twelve (12) month period.

7. Visible particulate emissions from S-27 shall not exceed Ringelmann 0.5.

8. Deleted. (Startup Source Test completed and verified by District Source Test Division in 1994. Startup source tests demonstrated compliance with Parts 2 and 4. October 2004)

9. The owner/operator of S-27 Boiler is subject to the requirements of NSPS Subpart Dc: Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units.
(basis: NSPS Subpart Dc)

10. The usage of natural gas and fuel oil shall be recorded monthly in a District approved data log and retained for at least two years from the date of entry. The fuel oil usage shall also specify the actual days of oil burning. The log shall be kept on site and made available to the District staff upon request.

RECOMMENDATION
Issue a change of condition to the Chiron Corporation for the following source:

S-27 Johnston Boiler - Multifuel, 450 HP, 18.96 MMBtu/hr

EXEMPTIONS
None

By:_____
Pamela J. Leong
Air Quality Engineer II
March 14, 2006